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☐ 1: Clin Exp Immunol 1999 Jun;116(3):527-33

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Rapid conversion of naive to effector T cell function counteracts diminished primary human newborn T cell responses.

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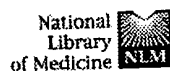
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The reduced incidence of graft versus host disease following the use of human cord blood as a source of stem cells for bone marrow reconstitution challenges our understanding of the immunocompetence of newborn T cells. Newborn CD4⁺ T cells express mainly the CD45RA phenotype and have been considered to respond comparably to adult CD4⁺ T cells exhibiting the CD45RA phenotype. We compared the in vitro kinetics of phenotypic conversion of newborn and adult CD4⁺CD45RA⁺ T cells to CD4⁺CD45RO⁺ T cells. The cytokine profile and B cell helper activity of the converted CD4⁺CD45RO⁺ T cell population were also determined. Newborn CD4⁺CD45RA⁺ T cells were converted to CD4⁺CD45RO⁺ with significantly faster time kinetics than adult CD4⁺CD45RA⁺ T cells, following either phytohaemagglutinin (PHA) or anti-CD2 activation. Freshly purified newborn naive T cells did not produce IL-2, IL-4 or interferon-gamma (IFN-gamma) following stimulation, whereas adult naive T cells secreted IL-2 and adult-derived CD4⁺CD45RO⁺ T cells secreted all three cytokines under the same stimulatory conditions. However, newborn and adult CD4⁺CD45RA⁺ T cells, following primary stimulation and maturation in vitro, acquired the ability to secrete a Th1-type cytokine profile of IL-2 and IFN-gamma after secondary stimulation. Newborn CD4⁺ naive T cells that acquired the CD45RO phenotype in vitro also gained B cell helper activity equivalent to that of adult in vitro matured CD4⁺ naive T cells. These findings suggest that newborn and adult CD4⁺CD45RA⁺ T cell subsets are differentially responsive to various stimuli. They show that newborn CD4⁺CD45RA⁺ naive T cells can transform more quickly than their adult counterparts into functionally equivalent CD4⁺CD45RO⁺ T cells, a process that may be important to counteract the immature immune environment which exists in the newborn.

PMID: 10361246 [PubMed - indexed for MEDLINE]



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